# Book problems:

#1, 11, 13, 15 – check answers in back of your book

(20) $P(0) = 0.55$ (zero)
$P(1) = 0.32$
$P(2+) = 0.13$

1 person

(a) $P(2+) = 0.13$

(b) $P(1 \cup 2+) = P(1) + P(2+) = 0.45$

(c) $P(0 \cup 1) = P(0) + P(1) = 0.87$

(22) 2 people

(a) $P(0 \cap 0) = (0.55)(0.55) = 0.3025$

(b) $P(1+) = 0.45$ ← prob. of at least 1 semester

$P(1+ \cap 1+) = P(1+) \cdot P(1+) = (0.45)(0.45) = 0.202$

(c) $P(2+) = 0.13$

$P(2+ \cup 2+) = P(2+) + P(2+) - P(2 \cap 2)$
$= 0.13 + 0.13 - (0.13 \times 0.13)$
$= 0.2431$

(25) (a) $P(I) = \frac{342}{1005} = 0.3403$

(b) $P(E \cup N) = \frac{30+50}{1005} = \frac{80}{1005} = 0.0796$

$P(I) = 342/1005 = 0.34$
$P(P) = 583/1005 = 0.580$
$P(E) = 30/1005 = 0.029$
$P(N) = 50/1005 = 0.049$

(27) 3 people

(a) $P(P \cap P \cap P) = (0.5801)(0.5801)(0.5801) = 0.1952$

(b) $P(E^c) = 975/1005 = 0.9701$

↑ not equally important

$P(E^c \cap E^c \cap E^c) = (0.971)(0.971)(0.971) = 0.913$

© That they were all independent

(d) random people's opinions can be considered independent of each other, and they were polled @ random

(32) $P(O) = 0.45$
$P(A) = 0.40$
$P(B) = 0.11$
$P(AB) = 0.04$

(a) 1) $P(AB) = 0.04$

2) $P(A \cup B) = P(A) + P(B) = 0.51$

3) $P(O^c) = 1 - 0.45 = 0.55$

(b) 1) 4 people $P(O \cap O \cap O \cap O) = (0.45)(0.45)(0.45)(0.45)$
$= 0.041$

2) $P(AB^c) = 0.96$ = not being AB

$P(AB^c \cap AB^c \cap AB^c \cap AB^c) = 0.849$

3) $1 - P(A \cap A \cap A \cap A) = 0.9744$
$1 - (0.4 \times 0.4 \times 0.4 \times 0.4)$

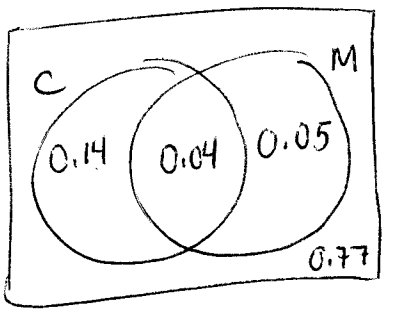
4) at least one person is Type B = not having all not be Type B

$P(B^c) = 0.89$

$P(B^c \cap B^c \cap B^c \cap B^c) = 0.627$
← no one is type B

$1 - P(B^c \cap B^c \cap B^c \cap B^c) = 0.373$
← at Least one is B

p. 361

② 


ⓐ $P(M \cap C^c) = 0.05$

ⓑ $P(M \cup C) = 0.23$

ⓒ $P(M^c \cap C^c) = 0.77$

⑤ ⓐ $P(USA) = \frac{1557}{7690} = 0.202$

ⓑ $P(\text{Same HS} \cup \text{Primary}) = \frac{4195 + 1161}{7690} = 0.6965$

ⓒ $P(\text{France} \cup \text{Post grad}) = \frac{\text{France} + \text{Post Grad} - F \cap P}{7690} = \frac{1539 + 379 - 69}{7690} = 0.2404$

ⓓ $P(\text{France} \cap \text{Primary or less}) = \frac{309}{7690} = 0.0402$

⑧ 24 D → 8 male, 16 female
18 C → 6 male, 12 female

ⓐ $P(M|C) = \frac{6}{18} = 0.333$

ⓑ $P(C|F) = \frac{12}{28} = 0.4286$

ⓒ $P(F|D) = \frac{16}{24} = 0.667$

⑪ ⓐ $P(USA \cap \text{Postgrad}) = \frac{84}{7690} = 0.0109$

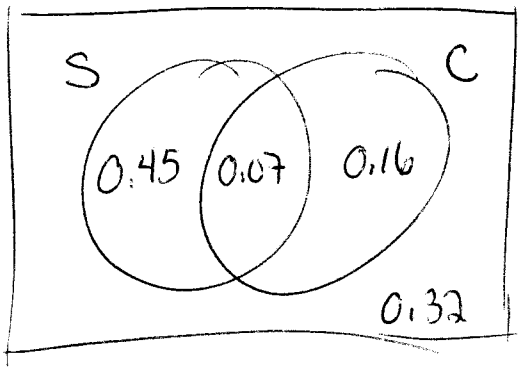
ⓑ $P(USA | \text{Post grad}) = \frac{84}{379} = 0.222$

ⓒ $P(\text{postgrad} | USA) = \frac{84}{1557} = 0.0539$

ⓓ $P(\text{Primary} | \text{China}) = \frac{506}{1502} = 0.337$

ⓔ $P(\text{China} | \text{Primary}) = \frac{506}{1161} = 0.4358$

(19)




(a) $P(S \cup C) = 0.68$

↖ eligible for BioResea

$1 - 0.68 =$ (0.32)

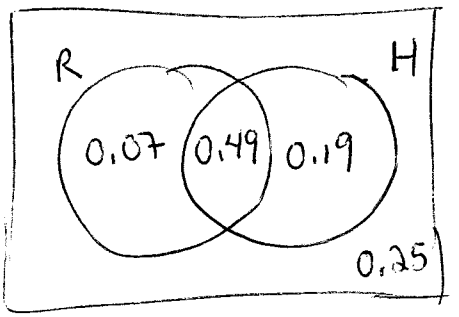
$P(S^c \cap C^c) = 0.32$

(b) $P(C|S) = \frac{0.07}{0.52} = \frac{P(S \cap C)}{P(S)} =$ (0.1346)

(c) NO! $P(S \cap C) \neq 0$

(d) no! $P(C|S) \neq P(C)$

(20)




(a) $P(R^c \cap M^c) =$ (0.25)

(b) $P(H|R) = \frac{P(H \cap R)}{P(R)} = \frac{0.49}{0.56} =$ (0.8

(c) $P(H|R) \neq P(H)$ NO! not indep

(d) $P(H \cap R) \neq 0$ NO! not disjoir
(or mutually exclus

(22) (a) $P(C|M) = \frac{P(C \cap M)}{P(M)} = \frac{0.04}{0.09} =$ (0.444)

(b) no! $P(M \cap C) \neq 0$

(c) no! $P(C|M) \neq P(C)$